

WHAT IS CLAIMED:

1. A transport apparatus for transporting materials or objects on substantially vertical structures for installation, deployment, inspection and/or repair purposes, comprising:

a plurality of gripping mechanisms, wherein said plurality of gripping mechanisms include a conformable gripping portion;

a plurality of links separating and operatively attached to said plurality of gripping mechanisms, wherein said links are mutually attached to permit angular movement of said links relative to each other about a pivot point; and

a latching mechanism.

2. The transport apparatus according to claim 1, wherein said gripping mechanism is rectilinear in shape.

3. The transport apparatus according to claim 1, wherein said gripping mechanism is curvilinear in shape.

4. The transport apparatus according to claim 1, wherein said gripping mechanism is characterized by both curvilinear and rectilinear features.

5. The transport apparatus according to claim 1, further comprising extensions connecting said links with said gripping mechanisms, wherein said extensions separate the links from the surface of the substantially vertical structure.

6. The transport apparatus according to claim 1, wherein said conformable gripping portion has a width dimension, wherein said width dimension is variable along the length of the gripping portion.

7. The transport apparatus according to claim 1, wherein said conformable gripping portion has a width dimension, wherein said width dimension is uniform along the length of the gripping portion.

8. The transport apparatus according to claim 1, wherein said conformable gripping portion includes a coating on the surface of the gripping portion contacting the surface of the substantially vertical structure.

9. The transport apparatus according to claim 1, wherein said conformable gripping portion comprises a plurality of layered materials, such that an inner material forms the surface gripping the substantially vertical structure and an outer material provides conforming capability.

10. The transport apparatus according to claim 1, wherein said gripping mechanism comprises a plurality of side segments and a plurality of center segments.

11. The transport apparatus according to claim 10, wherein said gripping portion comprises both said plurality of side segments and said plurality of center segments.

12. The transport apparatus according to claim 10, wherein said gripping portion comprises said plurality of center segments.

13. The transport apparatus according to claim 1, further comprising at least one sensor for sensing engagement, disengagement, or obstacles.

14. The transport apparatus according to claim 13, wherein said not less than one sensor comprises touch sensors.

15. The transport apparatus according to claim 13, wherein said not less than one sensor comprises force sensors.

16. The transport apparatus according to claim 13, wherein said not less than one sensor comprises contact sensors.

17. The transport apparatus according to claim 1, further comprising a controller.

18. The transport apparatus according to claim 17, wherein said controller comprises an on-board controller.

19. The transport apparatus according to claim 17, wherein said controller comprises a remote controlling device.

20. The transport apparatus according to claim 17, further comprising software directing movement of the climbing apparatus.

21. The apparatus for climbing objects according to claim 1, wherein said not less than two clamps comprises two clamps.

22. The apparatus for climbing objects according to claim 1, wherein said not less than two links comprises two links.

23. The apparatus for climbing objects according to claim 1, further comprising at least one actuator for rotating outward to disengage said gripping mechanism from the structure.

24. The apparatus for climbing objects according to claim 1, further comprising at least one actuator for varying the length of said conformable gripping portion.

25. A method for operating a transport apparatus for transporting materials or objects on substantially vertical structures for installation, deployment, or repair purposes, said transport device including a plurality of conformable gripping mechanisms operatively connected to a plurality of links separating and operatively attached to the

plurality of gripping mechanisms, wherein at least two of the links are spaced between each of the plurality of gripping mechanisms, and wherein the links are mutually attached to permit angular movement of the links relative to each other about a pivot point, and a controller, the method comprising:

engaging a substantially vertical structure in at least two locations with the conformable gripping mechanisms;

bringing a first conformable gripping mechanism into perpendicular relationship with said structure at a first position;

disengaging said first gripping mechanism from said structure;

moving said first gripping mechanism to a second position on said structure that approaches a second gripping mechanism which is in a conformed relationship with said structure;

gripping said structure with said first gripping mechanism at said second position by forming a conformed relationship with said structure;

decreasing the angular relationship of at least two of the plurality of links, wherein the movement of said at least two links brings said second gripping mechanism into perpendicular relationship with said structure at a third position;

disengaging said second gripping mechanism from said structure;

moving said second gripping mechanism to a fourth position along said structure that is more removed from the position of said first gripping mechanism by increasing the angular relationship of at least two of the plurality of links;

gripping said structure with said second gripping mechanism at said fourth position by forming a conformed relationship with said structure;

repeating the sequence of bringing a gripping mechanism into perpendicular relationship with said structure, disengaging a gripping mechanism, moving the disengaged gripping mechanism to a new position and gripping said structure by forming a conformed relationship between said structure and the gripping mechanism until the desired location is reached on said structure.

26. The method for operating a transport apparatus according to claim 25, wherein the controller directs the movement of the plurality of gripping mechanisms and the plurality of links.

27. The method for operating a transport apparatus according to claim 25, wherein the transport apparatus further includes at least three conformable gripping mechanisms operatively connected to the plurality of links such that at least two of the links are spaced between each of the at least three of gripping mechanisms, and wherein the links are mutually attached to permit angular movement of the links relative to each other about a pivot point, and at least one actuator operatively attached to each of said gripping mechanisms to enable the gripping mechanism to be angularly removed from the structure, method further comprising:

removing at least one of said gripping mechanisms from engagement with the structure as the transport apparatus moves along the surface of the structure, wherein removing comprises rotating said at least one gripping mechanism outward from the structure;

returning said removed gripping mechanism to engagement with the structure as the transport apparatus moves along the surface of the structure, wherein returning comprises rotating said removed gripping mechanism inward to engage the structure.